Upgrading the ICT curriculum of a multi-disciplinary degree evolving from practical orientation to university integration

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Abstract

In Flanders, Belgium the master degree of industrial engineering has just been integrated into the universities, imposing a shift from a more practical point of view to a tighter relation between (applied) research and education. A similar process is taking place in several European countries. This paper tells the success story of how to upgrade the ICT component of the program while maintaining both the success rate and the satisfaction of students.

As always, the challenge is set by the context. The multidisciplinary character of our degree where Electronics/ICT is just one of 6 options after a common base of 94 credit points results in many small courses – typically just 3 credit points – and a friction between students disliking ICT and a thorough preparation for consecutive ICT courses in the major Electronics/ICT.

The paper presents several design choices throughout the 4 year program, such as the compromise between *objects first* and *algorithms first* in the first course involving a tiny bit of VBA in Excel and a focus on Java; early exposure to MVC and other design principles; and the integration of our research in the master courses by gradually exposing it to the students, from a voluntary topic in a course with capita selecta, over master thesises to a devoted course open to every student. This helped us in formulating our research topic more precisely, especially for newcomers to the subject.

The paper also presents a BlueJ extension which enables students to autonomously evaluate their adherence to international coding standards and the use of Javadoc.

Finally, our counter-motto is *"Modest expectations give modest results"*. We always try to challenge students by giving assignments they love working on and that can make them proud of their achievements. Our ultimate reward is the proud sparkle in the eye of students, e.g. presenting their own Java program with animations, threads and MVC after just 6 credit points of programming.

Keywords: multidisciplinary ICT education, research integration, Java, BlueJ

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